Commercial Space Transportation Advisory Committee

October 22, 1998, Fall Meeting

MINUTES

COMSTAC Chair, Steve Flajser, convened the meeting at 8:30 a.m., and welcomed COMSTAC members and guests. His first order of business was to announce the selection of COMSTAC member, Livingston Holder, as COMSTAC's Vice Chairman.

Chairman Flajser next highlighted several important events including the passage of the Omnibus Budget Bill, NASA's 40th anniversary, and John Glenn's upcoming space flight. Mr. Flajser discussed the status of the commercial space transportation and satellite industries, pointing out the commercial launch legislation which had recently passed, and the progress being made in the deployment of Low Earth Orbit satellite systems including ORBCOMM, Iridium, and Globalstar. He also emphasized the progress in EELV development, as well as the launch operations of Sea Launch and the Delta 3. Mr. Flajser concluded his remarks by mentioning the changes taking place for the commercial launch and satellite industries, especially brought about by legislative (e.g., the 1998 Commercial Space Launch Act of 1998), policy and regulatory initiatives and asked what COMSTAC's role should be as these initiatives evolve.

REPORT ON AST ACTIVITIES

Ms. Patricia G. Smith, Associate Administrator for Commercial Space Transportation, provided a comprehensive update of activities by the office of the Associate Administrator for Commercial Space Transportation (AST). Prior to Before her report, Ms. Smith presented a plaque to outgoing COMSTAC member, Rick Hauck, and acknowledged his outstanding work on the Committee, including his chairmanship of the COMSTAC Working Group on Risk Management. Chairman Flajser also expressed his appreciation to Mr. Hauck for his work on COMSTAC and also for his work as a Shuttle astronaut, stating that Mr. Hauck brought "this country back into space with regard to the Shuttle."

Ms. Smith reported that in FY 98, AST issued 22 licenses (an increase of 8 from the previous year); issued 2 launch site operator licenses to Virginia and Alaska; and met or exceeded AST's 180 days statutory deadline for licensing decisions. She reported that the 100th launch licensed by AST took place on September 8th when the Delta 2 placed 5 Iridium satellites in their assigned slots.

For AST's regulatory initiative, Ms. Smith reported that the Financial Responsibility Final Rule had been published and that the Final Rule for Licensing Launches from Federal Launch sites has been drafted. Notices of Proposed Rulemaking (NPRMs) are being drafted for Licensing Requirements for Operation of a Launch Site and for Launch Operations on Non-Federal Sites. She reported that with the enactment of HR 1702 providing FAA with the authority to license reentry operations, AST is now required to publish an NPRM on Reentry Regulations within 6 months.

For international activities, Ms. Smith reported that Beal Aerospace is pursuing launches from the Caribbean and Kistler Aerospace has signed an agreement with the Australian Government to launch from Woomera, Australia.

Ms. Smith highlighted other AST activities and initiatives including:

- the development of a draft concept of operations to integrate the needs and requirements of space transportation into the National Airspace System. AST is working with other FAA Offices and the Air Force on this initiative;
- the establishment of a Hybrid Vehicle Integrated Product Team to evaluate new reusable launch vehicles whose designs are a combination of launch vehicle and aircraft;
- the support of the Evolved Expendable Launch Vehicle (EELV) program through participation in the EELV Summit Meetings which addressed commercial licensing and liability requirements, and the Launch Services Source Selection Advisory Council which established the course for the final phase of EELV development;
- participation in several Air Force Integrated Product Teams (IPT) with other agencies. One such IPT is the Air Force Range IPT, developed as a result of the need to improve range efficiency to meet national space access at Vandenberg AFB and Cape Canaveral; and
- the development of a Safety Inspection Training Program to prepare the FAA to assume greater safety oversight during hazardous prelaunch activities for commercial launches.

Ms. Smith concluded her remarks with a report on AST′s successful first annual Commercial Space Transportation Forecast Conference, held in February 1998, stating that over 250 people attended and participated. She announced the second annual conference, scheduled for February 9-10, 1999, at the Washington Plaza Hotel at Thomas Circle in downtown Washington, D. C.

REPORT ON CSOSA

Major Tom Lollis, Space Planning and Strategy Directorate in the Office of the Deputy Assistant Secretary of the Air Force for Space Plans and Policy, presented a report on the Commercial Space Operations Support Agreement (CSOSA). Major Lollis began by stating the Government policy of encouraging the fullest commercial use of space and CSOSA′s purpose: "to set forth terms and conditions under which the Air Force will furnish government facilities, launch property and/or launch services to the user."

He reported that on September 22, 1998, Keith Hall, Assistant Secretary of the Air Force for Space, endorsed the CSOSA and sent it to General Myers, Commander, Air Force Space Command, for implementation. Major Lollis indicated that the formal signing by General Myers and industry representatives from Boeing, Lockheed Martin, and Orbital Sciences Corporation, was scheduled for October 27th.

Major Lollis concluded his presentation by reporting that the signed CSOSAs would be sent to the 30th Space Wing in California and the 45th in Florida to attach detailed annexes for specific services and properties; that Space Command would schedule other signings with other

customers, and that other SOSA-type agreements are being considered for state-sponsored agencies.

COMMERCIAL LAUNCH LEGISLATIVE UPDATE

The legislative update was presented by Mr. Dick Obermann, Minority Professional Staff member on the House Committee on Science. Mr. Obermann began by highlighting the passage of the Commercial Space Act of 1998 (HR 1702), which provides the authority for FAA to license reentry vehicles, and extends the requirement for the Government to purchase commercial launch services subject to certain waivers and provisos. He reported that HR 1702 also calls for a study of federal launch requirements and facilities, and includes a provision which codifies the Administration's position on the use of excess missile assets.

Mr. Obermann also reported on the:

- **inclusion of a provision for indemnification cross waivers for the X-33/X-34 flight test programs in the Veterans Administration/Housing and Urban Development Independent Agencies Appropriation Bill;**
- **introduction of legislation by Senator Breaux that would provide for a governmental loan guarantee to encourage the development of new transportation systems; and**
- **transfer of the licensing authority for communication satellite exports from the Department of Commerce to the Department of State.**

Mr. Obermann mentioned briefly the current argument regarding whether the limitations on the use of foreign launch vehicles strengthens or impedes the U. S. launch industry. He indicated that the new Congress would probably focus on the reauthorization of indemnification language and government incentives to promote the development of new transportation systems. He concluded by expressing a desire that the COMSTAC consider the issue of orbital debris and debris mitigation in the near future.

REPORT ON SATMS

Kelvin Coleman, AST Project Engineer and Reginald Matthews, Manager, Airspace and Rules Division in FAA Air Traffic Airspace Management Office, reported on the status of AST's initiative to develop a Space and Air Traffic Management System (SATMS). Mr. Coleman defined SATMS as a concept to allow for the inclusion of commercial space transportation as an integral component of the National Airspace System. He noted that SATMS is a long-range corporate project to support FAA's goal of system efficiency, with expected key results in 2005.

Mr. Coleman discussed the SATMS Concept of Operations (CONOPS) document which will address the needs of the commercial space transportation industry in order to be fully integrated into the NAS Modernization Plan, also expected to be completed in 2005. He explained that the document would provide a generic (all types of launch vehicles), high-

level description of commercial launch operations in the NAS in 2005. Mr. Coleman reported that the CONOPS document has been drafted and is currently in coordination within FAA.

Mr. Matthews commented briefly on the strategic actions by FAA's Air Traffic Services, along with other FAA Lines of Business and the Department of Defense to deal with issues such as SATMS and to ensure a seamless integration of commercial space transportation into the NAS.

COMSTAC member, Alex Liang, commended AST for being forward looking in the development of this initiative and stated his belief that the SATMS initiative would require interaction with U. S. Space Command. He added that the Air Force could supply interconnectivity, interaction, and interoperability for such an initiative.

COMSTAC member, Paul Fuller, asked whether the first flight of the X-33 reusable launch vehicle, scheduled for early 2000, would cause problems, since it would fly over land and there might be aircraft interference. Mr. Matthews responded that traditional methods of separation would be used to advise the public of spacecraft operation, that NASA and the contractor would handle the safety aspects, and that FAA is currently doing modeling and simulation to look at the potential for aircraft interference.

COMSTAC member, Lou Gomez, reported that the State of New Mexico has legislation which allows deductions for gross receipt tax for space operations which identifies 60,000 feet as the separation point (from airspace to space).

GPS UPDATE

Mr. Harry Hodges, a member of FAA's GPS Product Team, provided a comprehensive update of GPS. He pointed out that the basic GPS system includes the space segment consisting of 24 satellites, 6 orbital planes (orbiting about 11,000 miles in the sky approximately every 12 hours), and 4 satellites per plane; and the ground control segment which includes a master control station in Colorado Springs, and 5 monitor stations at worldwide locations.

Mr. Hodges noted that GPS is benefit-driven system, available to all nations and free of direct user charges. He highlighted several other major benefits of GPS including the benefit of improving aviation system safety, its availability for primary use in the oceanic phase of flight, and its cost effectiveness for nations with limited air navigation infrastructures. He also noted; however, that the system does have certain limitations and because of this, FAA is procuring and developing the Wide Area Augmentation System (WAAS) and the Local Area Augmentation System (LAAS). Mr. Hodges provided a detailed description of the make-up, capabilities, benefits, and status of the WAAS and LAAS systems.

Mr. Hodges also discussed the international cooperation activities associated with the WAAS, including the Japanese MSAS system and the European EGNOS system. He

pointed out that the international collaboration supports all modes of transportation and provides public safety, environmental management, and mapping, surveying and Geodesy services.

He noted that as the worldwide system is expanded, it is of critical importance to protect the GNS navigation spectrum worldwide.

COMSTAC member, Alex Liang commented that GPS would never be a sole navigation source for launch vehicles because of range safety requirements. In response, a representative of the Air Force pointed out that by the year 2003, GPS would be the primary means of range safety data for tracking for launch operations.

REPORT ON THE FAA FINANCIAL RESPONSIBILITY FINAL RULE

Esta Rosenberg, AST Legal Counsel, provided a review of the Final Rule for Financial Responsibility (14 CFR Part 440), released in October, including an explanation of maximum probable loss (MPL), the methodology used to make an MPL determination, and the process used by AST to assess MPL for the flight of a launch vehicle.

Ms. Rosenberg defined MPL as loss which would only be exceeded at a given probability level: approximately 1 in 10 million chance that third-party losses will exceed $X (MPL value) and approximately 1 in 100 thousand chance that Government property losses will exceed $X (MPL value). She also discussed the assumptions for Government property damage, Government personnel, and Federal range safety requirements (i.e., that they will apply) in making MPL determinations, and noted that interagency coordination is carried out with other interested Government agencies - those that have personnel or property at risk as a result of licensed launch operations.

SPECIAL REPORT: UPDATE ON COMMERCIAL SPACEPORTS

"How State Governments Support Commercial Launch Activities"

Florida

Albert Thomas, Director of Operations for Spaceport Florida Authority (SFA), discussed SFA's role as a governmental spaceport with statewide jurisdiction and responsibility for rulemaking for commercial space activities. He noted that SFA was also responsible for promoting space activity in Florida and nationwide; educational outreach; providing financing services, including bonding authority and fund-raising; developing governmental areas such as foreign trade zones; and other activities. He stressed SFA's emphasis on partnership arrangements with state and Federal government and industry to provide services and develop space infrastructure, such as SFA's partnership with NASA to develop a reusable launch vehicle hangar. Mr. Thomas highlighted the construction of a state-of-the art Customer Service Center for FSA.

Alaska

Charles Pugsley, Aerothermo Technology, substituted for Pat Ladner, Executive Director, Alaska Aerospace Development Corporation (AADC). Mr. Begsley provided a status report on the construction and development activities at the Kodiak Launch Complex. He announced that AADC had recently been granted a FAA Launch Site Operator's License to operate Kodiak.

California

Ms. Andrea Seastrand, Executive Director, California Space and Technology Alliance (CSTA), provided an overview of CSTA activities and the status of the California Spaceport Authority. She noted that CSTA is a nonprofit organization in a public-private partnership with the state of California, serving as the principle advisor to the Governor and the Legislature on space issues.

Ms. Seastrand stressed the large number of space resources available in California, including satellite manufacturers, Vandenberg Air Force Base as the premier U.S. launch site, and expanding growth in new launch technologies. She pointed out, however, that competition from other states and other countries was also increasing. Because of this growing competition, she reported that a high-level CSTA Space Committee has developed a strategic plan which outlines 21 priority areas to ensure the competitiveness of California's space industries, as well as to outline California space role in the 21st century. She also noted that one of the priorities for CSTA is the rewrite of the Commercial Space Launch Act.

New Mexico

COMSTAC member, Lou Gomez, provided a report on activities by the State of New Mexico, including the development of the Southwest Regional Spaceport (SRS).

Mr. Gomez is Program Manager for SRS in the New Mexico Office for Space Commercialization. He noted that the state government established the Space Commercialization office to foster space activities in New Mexico and to build a spaceport, pointing out the gross tax receipts deductions for space business in the state.

Mr. Gomez reported that there is currently no infrastructure development in progress for SRS, however, several important requirements have been completed including mission and facility requirements, extensive flight analyses and the Environmental Impact Statement. He pointed out the benefits of SRS, including minimal weather constraints, site altitude and latitude providing improved payload to orbit capability, and low population density.

Virginia

Dr. Billie Reed, Executive Director, Virginia Space Flight Center, reported on the status of the Center's development and some of the services available for launch operations. He reported that the Center can support the Athena and Taurus class launch vehicles, as well as the small EELV. He noted that there are 2 launch pads, pad 0-B which was dedicated on

September 14th and pad 0-A. He described the Center as a turnkey operation, with rocket motor storage, assembly, payload processing , and a full service airport with heavy landing capability.

Dr. Reed also reported on the partnership formed with the Center, NASA Wallops Flight Facility, and the Navy (Egis Test Center). He noted that the Center offers sales tax exemption, sales and use tax exemptions for vehicles, other equipment, and financing opportunities. He said that Virginia was also establishing a Foreign Trade Zone in cooperation with Dulles Airport.

WORKING GROUP REPORTS

Risk Management

Rick Hauck, outgoing Chairman of the Risk Management Working Group reported on the working group's meeting held on Wednesday, October 21st. He reported that the group discussed indemnification and risk sharing issues for RLVs, but focused primarily on the issue of the extension of Government indemnification authority for third-party liability for commercial launch service providers and satellite owners and operators. This coverage is scheduled to end in the Commercial Space Launch Act on December 31st, 1999. Mr. Hauck presented a resolution developed by the Risk Management Working Group to the full Committee. The resolution calls for the extension of this coverage for 10 years and proposed adoption of the resolution by the Committee. The resolution states:

The Title 49 USC, Subtitle IX, Ch. 701, should be amended to

extend, for a minimum of ten (10) years from its existing expiration

date, the Government's authority to indemnify private launch

participants against liability claims resulting from a licensed

commercial launch or re-entry to the extent claims exceeds required

insurance.

Chairman Flajser proposed that members be given 30 days to review the resolution and provide their decisions on its adoption. This would also allow those Committee members who were absent a chance to review and vote on the resolution. The Committee agreed to this proposal.

Technology and Innovation

Paul Fuller, Chairman of the Technology and Innovation Working Group, reported on the October 21st meeting and activities of the Working Group since the May 1998 meeting. He

discussed the briefing provided by NASA and DOD on the Government Space Propulsion R & D Programs at the October 21st working group meeting.

He also reported on the meeting held on July 28th for the Federal interagency community to brief the COMSTAC's 1998 GEO Mission Model and the 1998 LEO Market Forecast, produced by AST. Mr. Fuller noted that preparations have already begun for the 1999 study and he discussed the timeline for completion. He noted that the 1999 study would change from a Geosynchronous Transfer Orbit (GTO) to a Geosynchronous Earth Orbit (GSO) Mission Model and would be coordinated with AST's LEO Forecast.

For future activities, Mr. Fuller reported that the working group was planning to meet with the Air Force EELV Program Office in January 1999; the letter to industry for the 1999 Mission Model would be completed by December 1998, and that 3 meetings would take place in February, March and April 1999 to work on the 1999 Mission Model.

Reusable Launch Vehicle (RLV)

Michael Kelly, Chairman of the RLV Working Group, reported on the October 21st meeting held by the working group and on working group activities since its establishment at the May 1998 meeting. Mr. Kelly reported that the working group kicked off with a meeting in El Segundo on September 30th. He noted that the current priority of the RLV Working Group is to provide input to AST for the FAA Notice or Proposed Rulemaking (NPRM) on Reentry Vehicles which is scheduled to be completed by May 1999. He also noted that the working group was working closely with the AIAA's RLV Committee.

He reported that the next meeting would be November 10th also in California and that possibly, a meeting would be held once a month in order to get input into the FAA NPRM.

Wrap Up

Since there was no new business, the meeting was adjourned at 12:50 p.m., subject to the call of the Chair.

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Steven Flajser, Chairman, COMSTAC

ATTENDEES

COMSTAC Members

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Livingston Holder, Deputy Chairman, The Boeing Company

Eleanor Aldrich, AIAA

Robert J. Cowls, The Boeing Company

Louis Gomez, New Mexico Office of Space Commercialization

Michael Kelly, Kelly Space and Technology

Alex Liang, The Aerospace Corporation

Rick Hauck, AXA Space, Inc.

Paul Fuller, Rocket Systems Services, Inc.

Mark Bitterman, Orbital Sciences Corporation

Alternates

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Don McKenzie for Donald L. Cromer, Hughes Space and Communications

FAA/Associate Administrator for Commercial Space Transportation

Patricia G. Smith, Associate Administrator for Commercial Space Transportation

Brenda Parker, COMSTAC Executive Director

Manuel Vega

Ronald Gress

Herb Bachner

Stewart Jackson

Kelvin Coleman

Brett Alexander

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